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Social Media Resources for Participative Design Research

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ABSTRACT

We present our experiences of novel value from online social media for Participative Design (PD) research. We describe how particular social media (e.g. Facebook, Pinterest, WhatsApp and Twitter) were used during a five-year project on learning space design by the researcher and interested teachers across all research phases (contextual review, user studies, PD action research). Social media were used to source and share comments, photographs and video documentation, supporting participation in design research. Based on our experiences, we provide recommendations on informed worthwhile use of social media to enrich PD research by increasing diversity, recursivity and timely access to insights, informants, inspirations and influencers.

CCS Concepts

- Human-Centered computing → Interaction design
- Participatory design

Keywords

Online Social Media, Learning Space Design, Participatory Design, Design Research, Research through Design.

1. INTRODUCTION

Design research to develop a supportive tool for learning space design found online social media to be surprisingly valuable as a source of resources. A learning space is best understood as a set of *relationships* between users, space and its purpose and context, rather than as simply a physical entity, which loses its meaning when separated from its users and context [1]. A learning space is shaped by its wider environment and the objects and people who occupy it [4]; and may be a classroom, but also corridors, libraries, cafés and outdoor places etc. [16]. A tool for learning space design needs to be based on a relational understanding.

Learning spaces are also referred to as a *third teacher*, where students learn from other children, teachers and their *educational space* [6]. Learning spaces significantly impact education [9], but there is limited research on their relation to learning and teaching and very limited guidance for teachers on using and adapting architect-designed spaces to improve learning. A design research project thus set out to develop a tool to support informed reconfiguration of learning spaces to empower facilitation of teaching and learning. A PD research approach was essential.

A research though design methodology [5] was adopted with extensive creative design elements that let us respond to opportunities for insights and engagement. Social media Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than ACM must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from Permissions@acm.org.

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platforms proved to be a valuable resource, with their personalisable virtual spaces for online conversations and content sharing of rich visual and textual materials [12]. Crucially for our research, online social media cross geographic and cultural boundaries, and support

social networks as highly accessible useful virtual spaces where diverse individuals meet to share and develop a common interest.

Online social media enriched our research, which developed *Classroom Design Recipe* cards to support teachers to use and redesign learning spaces. Social media played multiple roles in the research process; enriching each phase in different ways, often based on the particular platform used (Facebook, Pinterest, Twitter, Blogs, WhatsApp and Flickr). The paper details the benefits that researchers, and the users of research, gained from use of multiple social media platforms.

2. THE RESEARCH

The research comprised three cumulative overlapping phases: a contextual review that associated examples of practice with the academic and wider literature; mixed qualitative method studies (observational and interactive) that focused on users' perceptions of learning spaces; and a research through design phase when *Classroom Design Recipe* was designed, evaluated and iterated. The research process increasingly involved "users" as more teachers and other educationalists engaged through social media. The roles of social media are outlined below.

2.1 Contextual Review

Early on in the contextual review (desk/secondary research), it became apparent that many theoretical positions were presented without concrete examples. Through searching for examples online, the researcher found that teachers shared successful learning experiences prolifically on personal blogs. With other web resources, these complemented the published academic literature. Teachers were visually documenting their own learning space projects, supplemented with rich contextual information.

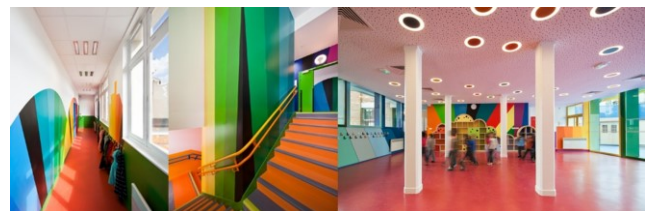


Figure 1: École Maternelle Pajol [14]

Online examples provided valuable clarification and support for more abstract theoretical published accounts of learning space design. For example, Figure 1 shows Palatre and Leclère's colour use for nursery school learning spaces [14]. Online searches were motivated by a need for examples of theoretical positions. What was found often went beyond being an example, to exposing the design meanings that mediate between theory and practice.

2.2 Users' Perceptions of Learning Spaces

The contextual review revealed an absence of users' voices in the formal literature, motivating us to extend our understandings of users' perceptions of learning space to add a missing inclusive PD perspective. Once the contextual review had resulted in a comprehensive framework, we started a second research phase to explore user experiences and user-designed elements of learning spaces. However, secondary (desk) research for the contextual review continued during this phase (our research phases overlapped), adding further examples for published theories, and also examples without a corresponding existing theory. Instead, in both the first two phases, theories were implicit in examples, exposing user perceptions of learning spaces that were not documented in the academic literature.

This added a second role for social media. Initially a source of concrete examples for a theoretical framework, it also was a secondary source of learning space theories "in the wild". Our understandings of users' perceptions of learning spaces thus had two sources. Firstly, we had primary data from physical field studies in Bahrain (15 teacher interviews; 400 images of teachers' classroom observations and planning books, and 170 students' images produced in drawing exercises). This sample and access was planned. Also, we had secondary data from online sources gathered over 7 months and involving at least 20 teachers' blogs. Both primary and secondary data spanned all of Sanders' approaches to PD by gathering understandings from what people *do*, what people *say*, and what people *make* [11]. What people do was revealed by primary observation and photos (primary and online), what people "say" by interviews and students' drawings (primary), and what people make by users' appropriation of what architects provide as design elements (e.g., floor, furniture, walls, lighting: both primary and secondary data). These design elements formed a toolkit for users when adapting their learning spaces. This provided design knowledge for the next PD research phase as examples of best practice.

Independent social media posts by teachers revealed how they and their students used and adapted learning spaces, revealing users' *'thoughtless acts'*: 'Things used in unintended ways...[which] usually indicate something about people's needs, and needs often translate into design opportunities' [13]. Visual examples helped to identify problems, and informed the final PD research phase that designed a tool to empower teachers' use of space. Primary and secondary data had indicated that teachers could be aware of the importance of *using* space, but not know how to do so. There was thus a gap between motivation and understanding.

Online sources thus complemented primary data on user perceptions as well as continuing to provide examples for the contextual review. The research value of social media for both phases was often platform specific, as follows:

2.2.1 Facebook

Facebook's huge community and "reach" enabled us to *directly communicate very widely* with different classroom users, across e.g. age range, gender, occupation, countries and cultures. Two questions were asked publicly on the researcher's Facebook timeline. These requested: reflections and memories about individual's own classrooms; and, projecting forward, a vision of their "dream" classroom. This first primary data from social media in response to a research request yielded 7 direct responses as additional examples of users' voices.

2.2.2 Twitter

Twitter hashtags in messages (# prefix) enables search and invites responses on particular topics [8]. The researcher (first author) was motivated to search for tags (e.g. #classroom) to

see what users had shared about learning spaces. These searches linked through to wider social networks via hashtags on Pinterest, blogs and other social media. This provided more secondary data on users' perceptions.

2.2.3 Blogs

'If you want the truth about school life, read the teachers' blogs' [15]. Blogs were used in the second phase to collect examples of problems and solutions, but they also revealed valuable ways to *communicate with* teachers, exposing a potential for impactful PD through close interaction between researchers and teachers. This would, potentially empower both, with teachers better enabled to use learning spaces to support teaching and learning.

2.2.4 Flickr

Flickr is a blend of images and networking. This content sharing platform, where teachers presented classroom displays and photos of associated activities, revealed teachers' competencies for design and use of classroom space.

2.2.5 Pinterest

Pinterest curates a visual montage of shared photos from multiple users to become a 'catalogue of ideas' [2]. Its visual search tool let the researcher quickly visually scan relevant material, with posted images often providing links to associated websites and teachers' blogs. Here, the researcher found a large diverse active teacher network sharing teaching and learning experiences. These included classroom activities, teaching tools, classroom makeover examples, learning approaches, classroom displays and teaching strategies. Pinterest was an especially rich visual data source on how users design learning spaces, within the space created by the architect. The teachers' posts exposed relationships between classroom design elements, and teaching and learning. This provided valuable design knowledge for the next phase.

2.3 PD Action Research

In designing a solution, the researcher was inspired by design opportunities that had emerged during earlier phases, to build upon both theoretical knowledge and findings on users' understanding in relation to practice. The last phase of research focused on developing the designed tool: a *Classroom Design Recipe* box containing sets of cards to support teachers to use and redesign spaces to facilitate teaching and learning (Figure 2). This tool's design built on Sanders' Convivial Tool concept [11] within Research through Design, a form of Action Research that uses creative practices as the core of a research methodology [5].



Figure 2: *Classroom Design Recipe* cards

Visual resources and experience reports from social media provided a wide range of insights, content and inspiration for tool design. Many resources gathered during exploration of the problem space became resources for the solution space, bridging research and design activities. The contextual review and users' perception research phases thus acquired an additional *research for design* function for both the problem and solution spaces.

Before explicit PD activities began, a broad community of teachers worldwide had already contributed, sometimes through engagement with the researcher, but mostly through sharing content online. And while the minority who were engaged during fieldwork (in Bahrain) nevertheless provided a broad range of participants for co-design and evaluation, this group expanded during the third action research phase.

During the design process, the researcher posted different formats of the Classroom Design Recipe cards on social media for wide distribution, and invited their download and use. The project website (classroomrecipe.blogspot.co.uk) also made all the sets of cards freely available, along with useful information, both in English and Arabic. The link to the website was then posted across social networks. The researcher thus used social media to engage teacher communities across geographical and cultural boundaries (Bahrain, USA, other countries) in dialogue.

After downloading and trialling *Classroom Design Recipe*, teachers posted redesign experiences on Instagram, or messaged, using WhatsApp. During this process, the researcher was available to answer teachers' questions and respond to comments, which helped to improve the tool [7]. Furthermore, some teachers posted videos, showing how they had applied the tool in practice. The WhatsApp groups, which formed around public social media conversations, proved to be particularly effective here. WhatsApp is the predominant messaging social medium in the Gulf countries (where Bahrain is located), with one billion users worldwide by February 2016. In response to requests made by the researcher, five teachers shared photographs taken during/resulting from their deployment of the *Classroom Design Recipe* tool on WhatsApp.

Participation through social media helped to overcome practical problems to 'get the job of designing a usable and meaningfully applied design done' [3] while at the same time gathering a PD community of teachers who could learn from each other, all of which informed the final design, enabling rapid prototyping and design tool iteration.

2.3.1 Social Media Platforms for Evaluation

Using social media as a resource to work across national contexts overcame unforeseen challenges encountered during research in the UK and Bahrain due to limited access to schools, during cultural and political difficulties (the field work was initially scheduled during the Arab Spring of 2011).

The WhatsApp mobile app facilitated timely communication with users and overcame geographical obstacles, which helped with evaluation. Discussions via WhatsApp had a better response rate than requests to teachers in Bahrain to engage in semi-structured interviews in the previous research phase (via emails and SMS), and brought more valuable comments due to the openness of the discussion, which was not led by the researcher's questions. A discussion involving eight actively engaged teachers in Bahrain shared students' responses to their applications of card sets, which were appreciated for their flexibility. A set of frequently asked questions (FAQs) was added in response to requests for technical details, as was a set of Interior Design tips cards.

Group online discussions could involve comments, questions or requests about the tool, directing the researcher to aspects that she had not yet considered. Furthermore, responses to the online version of the tool were more widely dispersed geographically (hard copies were only distributed in Bahrain): a US user on Pinterest pinned *Classroom Design Recipe* on a 'Project to try' board (uk.pinterest.com/louisapaio/projects-to-try/).

During evaluation, the researcher was contacted by a Bahraini government education expert through WhatsApp. She

messaged: '*I have attended lots of workshops that assert the importance of using learning space and the benefits teachers will get from facilitating space, however it does not explain how to use it.*' A resulting discussion revealed that the expert found the tool a very interesting concept, as it looked simple for teachers to apply in practice. This added tool evaluation from an influential expert.

An "unfocused" group grew online that demonstrated potential tool use beyond learning spaces, with sometimes unexpected responses from non-teachers. A mother asked if the tool could be used with her child at home, indicating an opportunity for use outside classrooms (prompting the researcher to use tool ideas at home with her children). Another unanticipated response was from a human resource professional who asked if interactivity in the tool could be applied in her office to encourage better use of a display board where different work news and suggestions were posted. The researcher replied that she could encourage employee interaction by attaching a shelf to the board to hold boxes for speech bubbles, emotional faces and ranking numbers. Cultural diversity here spanned organisations as well as nations. Rich diverse social network responses led to unexpected tool applications, supporting Lievrouw's position on activist new media [7], because the 'center' focus on learning spaces spread out to 'edges' of homes and office work, reconfiguring the tool and remediating its design elements within non learning spaces. Lievrouw's 'recursivity' was also achieved as participation quickly came to have value beyond the PD research: participation was not only a *means* to open tool design, but also an *end* in itself, supporting tool dissemination and use, and user feedback.

3. FINDINGS

Social media can play different roles in different stages of PD research. Social media revealed a wide range of designs presented using a variety of media, helping us to interpret the literature from users' perspectives, through academically unpublished projects. Social media provided visuals of design practice to support and augment, and sometimes question, academic literature. After that, social media complemented field research in Bahrain schools with diverse data about learning space usage. Again, a question arises as to whether this is primary or secondary data, in many ways – because we did not elicit this – it is the latter. Social media provided opportunities to encounter teachers' 'thoughtless acts' [13] through access to what teachers do, say, and make [11]. Most importantly perhaps, content that teachers posted via social media not only inspired much of the final design concept, but the various social media platforms helped to distribute the tool virtually, enabling take-up and evaluation by users, and an open design process of ongoing conversations with diverse participants from different backgrounds: an online unfocused PD group. Posted comments went beyond the envisaged evaluation, for example use in contexts beyond learning spaces, which generated further comments, reinforcing the PD nature of the unfocused group.

4. RECOMMENDATIONS

Before using social media in PD research, it is important to consider several issues:

- Social media should be selected to fit PD research activity. Participants need access to the internet. People in different online social networks interact differently. Some social media facilitate sharing visuals, some enable short text messages, many support both. Some support group discussions.
- Reliably controllable research methods are needed alongside less controllable social media resources, where the number and fit of participants are difficult to manage, as

is record keeping across a co-creative design process. With regard to evaluation, it was apparent that people downloaded and perhaps used the cards, but provided no feedback. Also, online social media users may not fit into a researcher's time scales. However, for the first two phases, opportunistic and unpredictable discovery of online resources was not an issue. Sufficient examples were found for the current sets of cards. As more sets are added, additional systematic searches and social media discussions may be needed.

- Longitudinal research should be planned, as long periods of engagement are needed; the researcher must plan for significant time, effort and sometimes "emotional work" in communicating with participants. Once participants post their own designs, significant investment and care is needed when giving feedback, answering questions, and socialising.
- Using online social media can provide worthwhile cost effective, timely and convenient data collection on users' practices. However, social media evaluation can require much more time than other forms of evaluation due to the need to facilitate ongoing participation and communication, but social media can also recruit promoters and influential supporters.

5. DISCUSSION

Online social networks can enrich PD research by providing novel rich communication with participants (e.g., with the same hashtag interest), from many cultural backgrounds. Shared resources here are visual and textual, which is valuable for design research.

Early in the research process, where there is a need to understand the problem background, public communication with participants can be supported by hashtags. Later, where there is a need to understand and engage participants closely, private groups and messages can be used, as with WhatsApp in our last phase. Social networks formed via users' engagement can provide rich data for PD, and a capability to quickly create and communicate for a large participant community, with a correspondingly large set of contributions. This augments academic publications, extending researchers' understanding of problems beyond them.

Social networks provide examples of both problems and solutions. For example: teachers share the problem of crowded classroom space, as well as how they redesigned it. Exchanges of social media resources are fundamentally participatory. Other participants respond, offering opinions, while others share their own design responses to problems. Such participation helped the researcher to understand a range of user experiences and practices.

Social media opens up new opportunities for virtual participation and communication with its users all over the world, with diverse backgrounds and cultures. Most social media sites are worldwide sites. Yet there is limited research on social media use in PD ([3][7], see also [10]). To our knowledge, social media has not been used before for PD of the design of a learning space toolkit.

Social networks can reduce research, travel and venue costs by providing a free platform and tools where designers, researchers and users can work together. Carbon footprints are further reduced by alternatives to physical formats for distributing designs and collecting data. But the novelty here lies less in "more research with less resources" and more in enabling a participatory space that elicits and stores multiple viewpoints from diverse users.

6. CONCLUSION

PD relies on user participation. Online social networks are built and reinforced through users; therefore, online social media can enrich PD research to provide valuable benefits. Social media can play different roles in PD research. Initially, it provides understandings beyond the academic literature. After that, rich data extends understanding without the need for supervised research activities. Finally, it can help in distribution, use, evaluation, and endorsements of tools with many participants.

Our experiences with the development of the *Classroom Design Recipe* tool have extended explicit participation beyond face to face design and evaluation workshops with invited participants, and have also enabled implicit participation in the initial phases of PD research. Our experiences have been positive and we will continue to use social networks in future developments of the *Classroom Design Recipe* tool.

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